USER'S GUIDE

MODEL: KVM-100D

PART NO.: 45-124

Hipotronics inc.

applied high voltage technology for industry utilities & science

MP MASTER
MA35117

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OPERATION

Inspection

The unit is supplied in a protective carrying case. All necessary parts and components should be contained within this case. An inspection should be performed before use to insure all necessary items are present and in working order.

a. Place the case on the floor in the upright position. Flip upward and disengage the four over-center latches. Remove the top end cover to expose the readout device. Pull the readout device out of the carrying case. This will expose the cable compartment. This should include one twenty-five foot length of coaxial cable with BNC type connectors for interconnecting the readout device and the divider assembly. A length of braided cable is supplied to be used as a ground lead for the divider. Also, there should be a power cord to allow the readout device to be plugged into an a.c. outlet for recharging the batteries.

b. Flip downward and disengage the bottom four over-center latches. Lift the white case upward away from the base assembly. This will expose the high voltage divider assembly.

Inspect all equipment and surfaces for obvious defects. The divider should be clean and oil free. Connectors and hardware should be tight and undamaged. The readout device should be checked for battery condition. Throw Power switch to ON position. Meter digits should glow and should zero in a short time to within $\pm$ five counts. If meter light level fades or does not zero, recharge batteries with Power switch in off position.

Charging

To recharge the internal batteries connect the power cord to the readout device and plug into an a.c. outlet. The On Charge indicator will light when power is applied. A full charge takes about sixteen hours when the batteries have completely run down. This charge should last for eight hours of use.

a. The batteries can not be overcharged. The charger is self-limiting and can be left on indefinitely.

b. The unit may be operated with the charger on. This allows immediate use of a unit with low batteries and provides operation for longer than an eight hour period.

c. If the unit is to be stored for some time the batteries should be charged first. Do not allow long intervals of time with discharged batteries. This will degrade life greatly. Always turn Power switch to Off position when not in use or before storing.

Re-assemble unit in carrying case for field operation or storage.

DESCRIPTION

This kilovolt meter system consists of two components - a high voltage divider and a precision readout device. These components fit inside a single durable carrying case which makes the system field portable. All interconnect and power leads are neatly stored inside as well.

The durable carrying case and battery operation make the system completely portable for field testing while the wood-grained control cabinet and divider assembly make it ideal for precision laboratory use.

The divider assembly is self contained and is a true passive voltage divider. The unit is designed to operate into a resistive load of one megohm. When used with its supplied coaxial cable a capacitive load of up to 500 picofarads can be tolerated with less than one percent accuracy change. While the divider is designed to be used with the supplied readout device it may also be used with an oscilloscope, strip chart recorder, etc. as well, keeping in mind the standard loading.

The readout device is a precision instrument designed to work in conjunction with the divider assembly. The unit is battery operated and self contained, including a charger. The many measurement modes offered by this device enable the operator to make quick and meaningful readings on various voltage waveforms. The stable circuits and digital readout provide long term accuracy.

CONTROLS AND INDICATORS

FUNCTION

D.C. The D.C. mode measures the average value of the direct current component of any voltage waveform. The digital meter will automatically indicate the correct polarity and value. The Coupling Switch must be in the D.C. position to use this mode. The A.C. position inserts a blocking capacitor in series with the signal line and therefore blocks the d.c. component.

The signal source may be a time invariant d.c. level (∿ battery) or a complex waveform that is time variant (unfiltered d.c. power supply). In any case the indicated value will be the average (over a period of ∿ .2 sec.) of the d.c. component.

ABS AV The Absolute average mode rectifies the input waveform (takes the absolute value) and then averages this value. Most universal voltmeters use this technique. This is analogous to using a bridge rectifier and a d.c. meter to measure an a.c. waveform. This mode will respond to both a.c. and d.c. components. The indicated value will be the algebraic sum of the average d.c. component plus the average value of the a.c. component, in the d.c. coupling mode. The a.c. coupling mode removes the d.c. component

RMS The Root-Mean-Square mode indicates the true r.m.s. value of any waveform. This is accomplished by means of a single integrated circuit which directly computes the rms value of a complex waveform. The converter will accurately convert signals with crest factors of up to five. (Peak value of five times the amplitude of the r.m.s. value) The r.m.s. value of a complex waveform with a d.c. component is the vector sum of the two components, i.e. $(d.c.)^2 + (RMS)^2$ The a.c. mode will remove the d.c. component from the expression. All calculations are done automatically. Note, there are no negative values in r.m.s. mode.

PEAK +, PEAK - - The Peak mode will indicate the peak values of waveform being measured. The Positive Peak mode will capture the highest or most positive excursion of the waveform even though this may be a negative polarity. Conversely, the Negative Peak mode will capture the lowest or most negative excursion. The measurement interval is averaged but over a relatively long time (5 seconds) to keep the error low.

CALIBRATION Absolute - Sine Reference

This switch provides a handy means of converting between calculated values and real values of various waveform values. Most meters are calibrated in r.m.s. but are not rms responding.

Therefore they measure in one mode and then have a conversion factor built in that relates to an rms value for a sine wave only. If the waveform is distorted or is not a sine function large errors will result.

In the Sine Ref. position the meter will indicate the equivalent r.m.s. reading based on a sine wave value but measured with the selected function. In the True position, the real value of that function will be indicated. See figure 1 for typical conversions.

COUPLING This toggle switch controls the internal signal buss. In the D.C. position there is a direct connection from the input jolt to the measurement circuits. These circuits, therefore, see the entire waveform to be measured, a.c. and d.c. component. In the A.C. position a blocking capacitor is inserted in the main signal path. This blocks the d.c. component from the measurement circuits and allows only the a.c. components to be measured. This is handy when trying to evaluate each independently such as the output of a power supply. The ripple component may be separated from the average d.c. level.

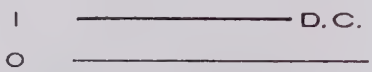
POWER This toggle switch controls the power to the main metering circuits. The illuminated digits in the meter indicate the unit is "on". The unit uses Nickel-cadmium batteries and is completely portable. This switch connects the batteries to the active metering circuitry. When the batteries are fully charged, the unit will operate for a total of eight hours before requiring a recharge. Recharge requires about sixteen hours with the unit plugged in and the Power switch off. The Charging indicator will come on when a.c. power is supplied to the charger circuits. The unit may be operated under a.c. power as well when the batteries are low or for extended periods of time.

RANGE A two position rotary switch selects a Low or High range of the meter. The decimal point will move automatically to always indicate a value in kilovolts. For maximum accuracy, the largest reading or highest deflection should be used.

O/L The Overload indicator will blink whenever the measuring circuits are overloaded and become non-linear. This is possible when measuring low duty cycle signals such as pulses. This indicates that the reading on the meter is not correct.

The meter range may be exceeded also. This condition results in the digits of the meter turning off with only the "1" left illuminated. If this happens, switch to a higher range or reduce the measuring voltage.

FIGURE 1

WAVEFORM	DC	|AV|	RMS	+PK	-PK
SINE	0	.637	.707	+1	-1
RECT SINE	.637	.637	.707	+1	0
$\frac{1}{2}$ RECT SINE	.318	.318	.500	+1	0
TRIANGLE	0	.500	.577	+1	-1
TRIANGLE	.500	.500	.577	+1	0
SQUARE	0	1.000	1.000	+1	-1
SQUARE	.500	.500	.707	+1	0
D.C. 	1	1	1	1	0

EFFECTIVE VALUES OF VARIOUS WAVEFORMS

The factors shown are effective values for each ideal waveform, assuming a peak value of unity. To calculate a particular voltage, multiply the peak voltage of that waveform by its corresponding factor. This is done automatically by the readout device in the absolute (ABS) calibration mode.

The sine reference calibration mode (SINE REF) yields an effective r.m.s. value based on a sine waveform. In this position the readout will respond in the selected function, but will be calibrated in r.m.s.

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Re-assemble unit in carrying case for field operation or storage.

Voltage Measurement

Unpack the unit and set up in the area to be used. The following guidelines should be observed;

1. A minimum area must be maintained around the High Voltage Divider that is free of all conductive articles. This area is at least a radius in all directions, except downward, equal to the height of the divider.

2. Connect the braided ground lead to the ground connector at the base of the divider. Clip the other end to a solid station ground.

3. Connect one end of the coax interconnect lead to the signal connector at the base of the divider. Connect the other end to the readout device signal input.

4. A ground lead at the readout device is optional once the divider is securely grounded. However, for maximum operator safety in the event of flashover, a ground lead should be attached to the readout device to a separate reliable ground as well.

5. Connect high voltage lead to the top toroid on the divider assembly.

6. Turn read device power on and allow one minute for stabilization. Apply high voltage. Measure as needed (see controls)

7. Shut down high voltage. Verify voltage is down on meter readout. Short high voltage point to ground. Turn meter power off - disassemble in reverse order and repack all components in carrying case.

MODEL KVM-100D

SPECIFICATIONS

Readout Section

Display	Digital, 3½digits, ½" LED Auto polarity
Range	High, 0-9.99kV Low, 0-9.99kV
Input	Impedance = 1 megohm Level = 100V F.S.
Accuracy	DC = ± .5% of F.S. AV = ± 1% of F.S. RMS = ± 1% of F.S. Peak = ± 2% of F.S.
Power	Internal battery, 4D size Ni-Cd External, 115/230V Operation - 8 hours, Recharge - 16 hours
Size	5" H x 10" W x 8½" D
Weight	5½ lbs.

Divider Section

Voltage Rating	100kV ac (140 kVp) 100kV dc
Ratio	1000:1with load impedance of 1 Megohm & >500pF
Input Impedance	380 Megohms, 100pF
Output Impedance	Approx. 613k ohms, .1uF
Freq. Response	DC to greater than 1 kHz
Size	15" H x 8" Dia.
Weight	12 lbs.

Complete Assembly

High impact resistant plastic carrying care
Removable top and bottom covers
Integral storage compartment
Size - 11 x 11 x 24-3/8
Weight - 35 lbs.

RETURNED MATERIAL

If, for any reason, it should become necessary to return the equipment described in this publication to the factory, the Warranty Service Department of Hipotronics must be contacted, at which time the following data must be given in order that we may identify the unit and determine the necessity for return. (Tel. (914) 279-8091) MODEL, SERIAL NO. and TYPE (Part No) is indicated on the black and silver tag affixed to the unit.

MODEL:
SERIAL NUMBER:
TYPE (Part No):
REASON FOR RETURN:
DEFECT:
ALLEGED CAUSE OF DEFECT:

If Hipotronics deems return of the unit appropriate, an "Authorization for Return" tag will be issued. This will instruct you as to the method of return. The pink copy is for your records, the hard copy to be affixed to the unit being returned. If return is not deemed advisable, other inspection arrangements will be made.

NOTE: Material received at this point without the proper authorization shall be held as "customer's property," with no service performed until such time as the proper steps have been taken.

Your cooperation is requested in order to ensure prompt service. Thank you.

PARTS ORDERING

To order replacement parts of this unit, please refer to the Parts List contained in the pocket of this publication. The number of the specific component is required, along with the TYPE (Part No) of the unit. The TYPE (Part No) is indicated on your Parts List, and on the black and silver tag affixed to the unit.

WARRANTY

HIPOTRONICS, INC. warrants to the orginal purchaser of any new merchandise that the merchandise is free from defects in material and workmanship under normal use and service for a period of one year from the date of shipment. The obligation of Hipotronics, Inc. under this Warranty is limited, in its exclusive option, to repair, replace or issue credit for parts or materials which prove to be defective, and is subject to Purchaser's compliance with the Hipotronics, Inc. Warranty Claim Procedure as set forth below. The happening of any one or more of the following events will serve to void this Warranty and any defect or damage resulting therefrom is specifically excluded from Warranty coverage: (a) defects due to accident, negligence, alteration, modification, faulty installation by Purchaser or Purchaser's agents or employee, abuse or misuse; (b) attempted or actual dismantling, disassembling, service or repair by any person, firm or corporation not specifically authorized in writing by Hipotronics, Inc. (c) defects caused by or due to handling by carrier, or incurred during shipment, transshipment or other move.

This Warranty covers only those parts and/or materials deemed by Hipotronics, Inc. to be defective within the meaning of this Warranty. The liability of Hipotronics, Inc. shall be limited to the repair, replacement or issuance of credit for parts deemed defective within the meaning of this Warranty. Costs incurred by purchaser for labor or other expenses incidental to the inspection, repair, replacement or issuance of credit for such parts and/or material shall be the sole responsibility of purchaser. This Warranty shall not apply to any accessories, parts, or materials not manufactured or supplied by Hipotronics, Inc. and if, in the sole discretion of Hipotronics, Inc., Purchaser's claim relates to any materials or workmanship manufactured or performed by the supplier of a component part, or of the manufacturer of a device of which the defective part is a component, Hipotronics, Inc. reserves the right to disclaim liability under this Warranty and to direct that the Purchaser deal directly with such supplier or manufacturer. Hipotronics, Inc. agrees to assist the Purchaser in processing or settling any such claim without prejudicing its position as to liability.

WARRANTY CLAIM PROCEDURE

Compliance with the following Warranty claim Procedure is a condition precedent to the obligation of Hipotronics, Inc. under this Warranty:

a. Purchaser must notify Hipotronics, Inc. in writing by certified or registered mail, of the defect claimed within twelve months after date of original shipment. Said notice shall describe in detail the defect, the defective part, and the alleged cause of defect.

b. At the exclusive option of Hipotronics, Inc., Purchaser shall dismantle or disassemble at Purchaser's cost and expense and shall ship the defective part or material prepaid to Hipotronics, Inc., Brewster, New York 10509, for inspection, or permit an authorized service representative of Hipotronics, Inc. to inspect the defective part or material at Purchaser's premises. If Hipotronics, Inc. shall inspect the part or material at the Purchaser's premises, Purchaser shall provide facilities for, and at Purchaser's cost and expense, dismantle, disassemble, or otherwise make accessible the subject part or material whether or not same is a component of or installed in a device other than that manufactured or supplied by Hipotronics, Inc. If disclosure shows that the defect is not one for which Hipotronics, Inc. is liable, the Purchaser agrees to reimburse Hipotronics, Inc. for all expense incurred.

c. Upon receipt of the defective part or material, or after access to same, Hipotronics, Inc. shall inspect the part or material to determine the validity of Purchaser's claim.

The validity of any Warranty Claim, Purchaser's compliance with Hipotronics, Inc. Warranty Claim Procedure, the obligation to either repair, replace, or issue credit, or direct the purchaser to deal directly with a manufacturer or supplier are to be determined solely and exclusively by Hipotronics, Inc. and any determination so made shall be final and binding.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED ON THE PART OF HIPOTRONICS, INC., INCLUDING THE WARRANTIES OF MECHANTABILITY AND FITNESS FOR USE, AND CONSEQUENTIAL DAMAGES ARISING FROM ANY BREACH THEREOF AND HIPOTRONICS, INC. NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON, FIRM OR CORPORATION TO ASSUME ANY LIABILITY OR OBLIGATION IN CONNECTION WITH THIS SALE ON ITS BEHALF AND PURCHASER ACKNOWLEDGES THAT NO REPRESENTATIONS EXCEPT THOSE MADE HEREIN HAVE BEEN MADE TO PURCHASER.

AC-DC Digital KVM

Model No: KVM100D
Part No: 45-124, REV A

A1	Subassembly, Read out Assembly, P/N 45-121, Rev A, Hipo
A2	Subassembly, HV Divider, P/N 45-114
	Plastic Carrying Case, DD45-127, Hipo
	Line Cord P2392, Switchcraft
	RG58/U Coax Cable w/BNC's 25 feet long
	Ground Braid 1/2"W x 6 ft. long
	Corona Spinning, 8"W x 2"H

PARTS LIST

KVM READ-OUT ASSEMBLY
PART NO: 45-121 Rev. B

REF.	DESCRIPTION	P/N
A1	Subassembly, Main Circuit PCB Assembly	30-539
A2	Subassembly, Switch PCB Assembly	30-536
A3	Subassembly, Charging/Power Supply	30-523
B1-4	Battery, 1.2 Volt "D" Size NI-CAD, Eveready	CH-4
C1	Capacitor, 15 uF @ 25 V	
J1	Jack, Amphenol	BNC UG-1094/U
J2	Jack, Binding Post, National Teltronics	1-873
J3	Jack, Switchcraft	EAC-301
M1	Meter, Digital, 3 1/2 Digit, Gralex	Series 30
P1,2	Plug, 16 Pin Dip Low Profile Connector, T&B	609-M165H
P3	Plug, 5 Pin, Molex	09-50-3051
R1	Resistor, 100 ohms, 2 Watt	
SG1	Spark Gap, 230 V, Siemens	B1-A230F
	Line Cord, 7 1/2" long, Switchcraft	P2392

REF.	DESCRIPTION	P/N
PCB	FAB	30-539
C1,5,6,10	Capacitor, 15 uF @ 25 V, Tantalum	
C3,4,7-9, 11, 13-15	Capacitor, .1 uF @ 100 V, Mylar	
C12,18	Capacitor, .1 uF @ 50 V, Disc.	
C16	Capacitor, .001 uF @ 1 kV, Disc.	
C17	Capacitor, .01 uF @ 160 V, Polystyrene	
CR1,4	Diode, (or substitute CR2,3: see schematic)	1N4148
CR2,3	Diode, 11 V, 1 W, Zener	1N4741
CR5-8	Diode	1N914
CR9	Diode	1N4007
IC1,2	Integrated Circuit, OP, Amp, (low offset)	LF351N
IC3	Integrated Circuit, OPTO-FET	H11F2
IC4	Integrated Circuit, Rms Converter, Analog Devices	AD536
IC5	Integrated Circuit, Quad Op Amp	LM339
IC6,7	Integrated Circuit, OP Amp	UA741
IC8	Integrated Circuit, Quad Nand Gate	MC14011
IC9	Integrated Circuit, Comparator, (low offset)	LM211
IC10	Integrated Circuit, Sample/Hold, Analog Devices	AD582
J1	Jack, 5 Pin, (w/locking tab), Molex	09-65-1051
J2,4	Jack, 10 Pin, Molex	22-03-2101
J3	Jack, 16 Pin, Dip Socket, AFE	LC-16
PS1	Power Supply, DC Converter, ISO PAK	EA5D15/60R
R1	Resistor, Factory Adjust, 1/2 Watt, 10%	
R2	Resistor, Factory Adjust, 1/2 Watt, 1%	
R3	Resistor, 1 M ohm, 1/2 Watt, 1%	
R4,13	Resistor, 950 k ohms, 1/2 Watt, 1%	
R5,6	Resistor, 50 k ohms, 1/2 Watt, 1%	
R6,7,15,16 20,21,39,40	Resistor, 330 k ohms, 1/2 Watt, 10%	
R8,12	Resistor, Trim Pot., 10 k ohms, Bourns	3386H-001-103
R10,41	Resistor, Trim Pot., 10 k ohms, Bourns	3069P-1-103
R11	Resistor, 45 k ohms, 1/2 Watt, 1%	
R14,22	Resistor, 220 k ohms, 1/2 Watt, 10%	
R17,19,25, 27	Resistor, 10 k ohms, 1/2 Watt, 1%	
R23	Resistor, 330 k ohms, 1/2 Watt, 10%	
R24	Resistor, Trim Pot, 100 k ohms, Bourns	3069P-1-1004

REF.	DESCRIPTION	P/N
R26	Resistor, 39 k ohms, 1/2 Watt, 1%	
R28,32	Resistor, 47 k ohms, 1/2 Watt, 10%	
R29,30,31	Resistor, 1 M ohms, 1/2 Watt, 10%	
R33,35,36	Resistor, 100 k ohms, 1/2 Watt, 10%	
R34	Resistor, 56 k ohms, 1/2 Watt, 10%	
R37,38	Resistor, 470 k ohms, 1/2 Watt, 10%	
R42	Resistor, 100 M ohms, 1 Watt, 10%	
R43	Resistor, 10 k ohms, 1/2 Watt, 10%	
R44,48	Resistor, 2.2 k ohms, 1/2 Watt, 10%	
R45, 49	Resistor, 3.3 k ohms, 1/2 Watt, 10%	
R46	Resistor, 4.7 k ohms, 1/2 Watt, 10%	
R47	Resistor, 1 k ohm, 1/2 Watt, 10%	
XIC1-3,6,7 9,11	8 Pin Low Profile, Dip Socket, AFE	LC-8
XIC4,5,8,10	14 Pin Low Profile, Dip Socket, AFE	LC-14

PARTS LIST

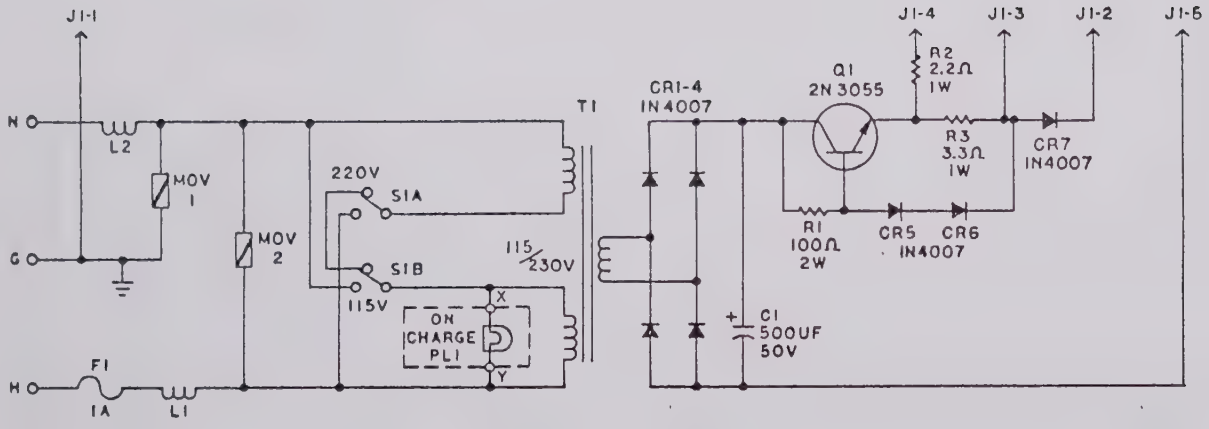
SWITCH CIRCUIT PCB ASSEMBLY
PART NO: DS60-536

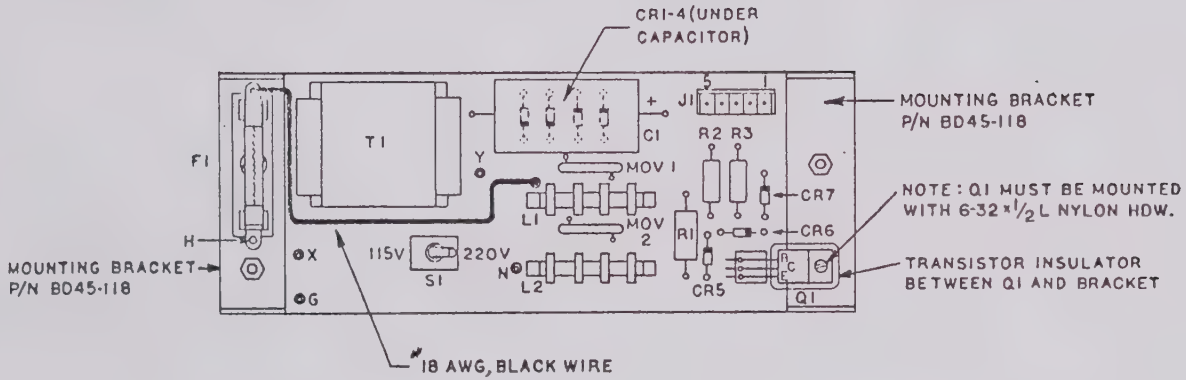
REF.	DESCRIPTION	P/N
PCB	FAB	30-536
J1	Not used	
J2	Connector, 16 Pin Dip Low Profile, AFE	LC-16
LED1	LED, Red with Mounting Hardware, H.P.	5082-4650
P1	Connector, 5 Pin, Molex	09-50-3051
P2	Connector, 10 Pin, Molex	22-01-2101
R1-4	Resistor, 10 Turn Trim Pot., 5 k ohms, Bourns	3067P-1-502
R5,7	Resistor, 12.4 k ohms, 1/2 Watt, 1%	
R6	Resistor, 11.3 k ohms, 1/2 Watt, 1%	
R8	Resistor, 16.8 k ohms, 1/2 Watt, 1%	
R9,11,15	Resistor, 10 k ohms, 1/2 Watt, 1%	
R10	Resistor, 1.1 k ohms, 1/2 Watt, 1%	
R12	Resistor, 3.74 k ohms, 1/2 Watt, 1%	
R13	Resistor, 10 Turn Trim Pot, 122 k ohms, Bourns	3069P-1-104
R14	Resistor, 10 M ohms, 1/2 Watt, 10%	
R16	Resistor, 9.09 k ohms, 1/2 Watt, 1%	
S1,4,5	Switch, Toggle DPDT, Alcoswitch	MTA206N-WW
S2	Switch, Rotary, Centralab	PA2002
S3	Switch, Rotary, Centralab	PA2004

PARTS LIST

CHARGING/POWER SUPPLY PCB ASSEMBLY
PART NO: CS60-523

REF.	DESCRIPTION	P/N
PCB	FAB	30-523
C1	Capacitor, 500 uF @ 50 V, Electrolytic	
CR1-7	Diode	1N4007
F1	Fuse, 1 A	3AG
J1	Connector, 5 Pin, Molex	09-65-1051
L1,2	Choke, 2.5 mH, 200 mA, J.W. Miller	4537
MOV1,2	Movistor, 250 V, General Electric	V250LA90A
Q1	Transistor, NPN	MJE-3055K
R1	Resistor, 100 ohms, 2 Watt, 10%	
R2	Resistor, 2.2 ohms, 1 Watt, 10%	
R3	Resistor, 3.3 ohms, 1 Watt, 10%	
S1	Switch, DPDT Toggle, Alcoswitch	MTA206N-PC
T1	Transformer, 10VCT @ 600 mA 110/220, Signal Corp.	LP-10-600



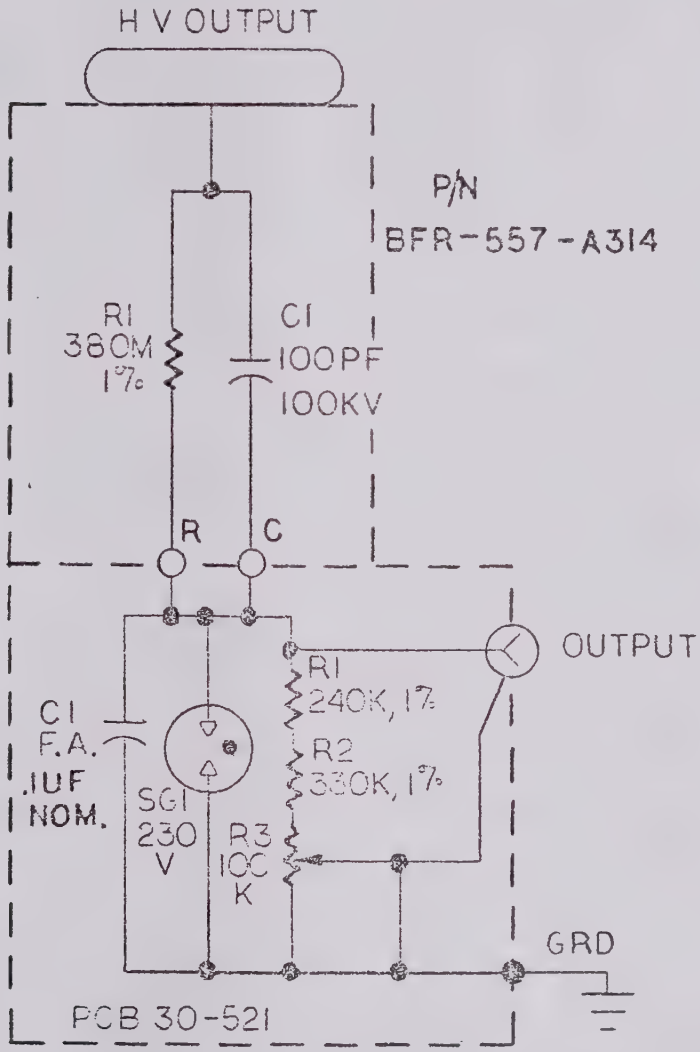


QTY	DESCRIPTION	PART NO	MATL OR NOTE
	CHARGING/POWER SUPPLY PCB 30-523		

HIPOTRONICS
BREWSTER, N.Y.

MATL			
FINISH	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DWG TOLERANCES	DRAWN JAN	DWG NO CS60-523
	FRACTIONS ± 1/64 · DECIMALS .005 · ANGLES ±30'	SCALE	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

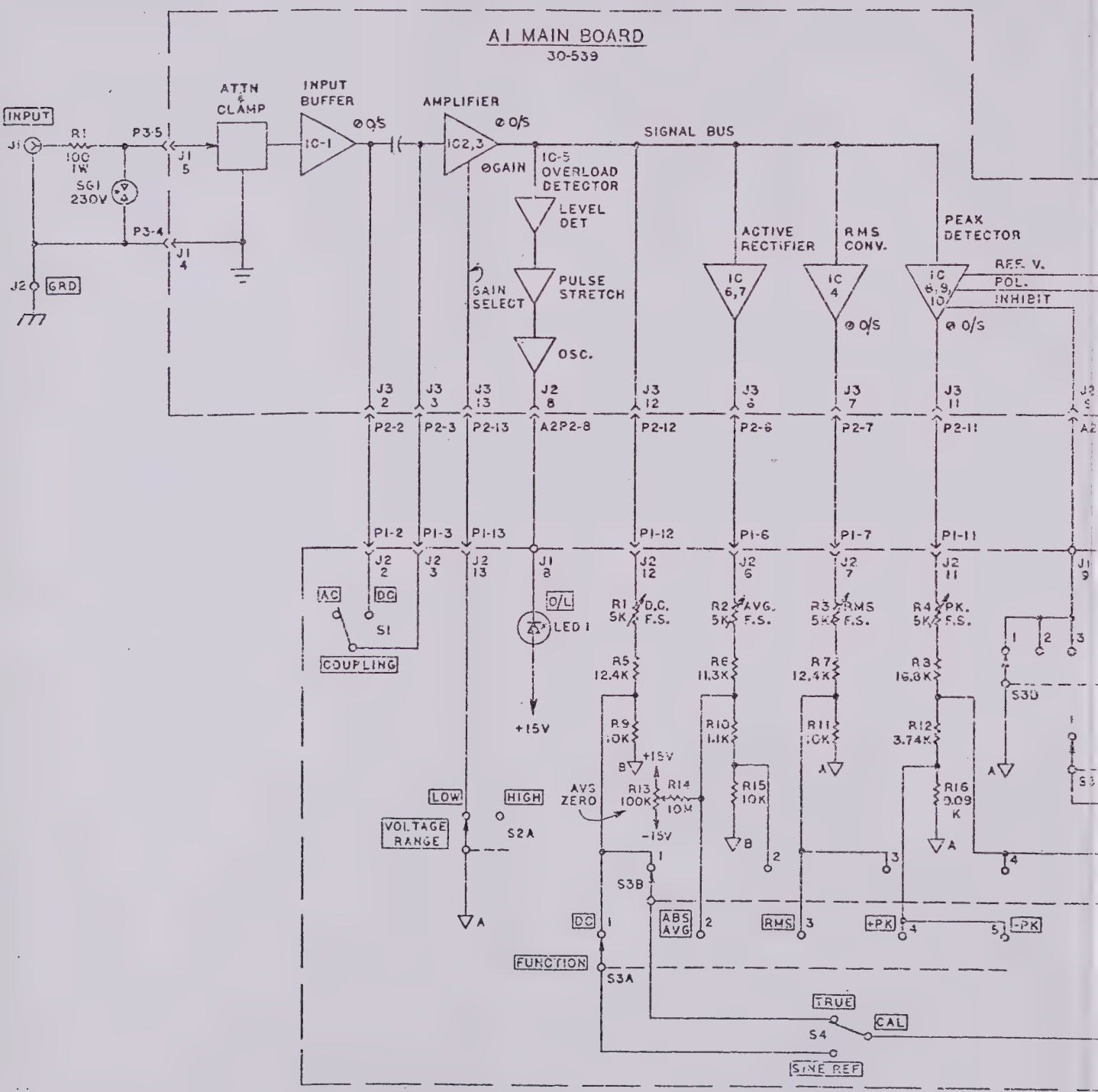


H V DIVIDER
1000:1
100KVAC/DC

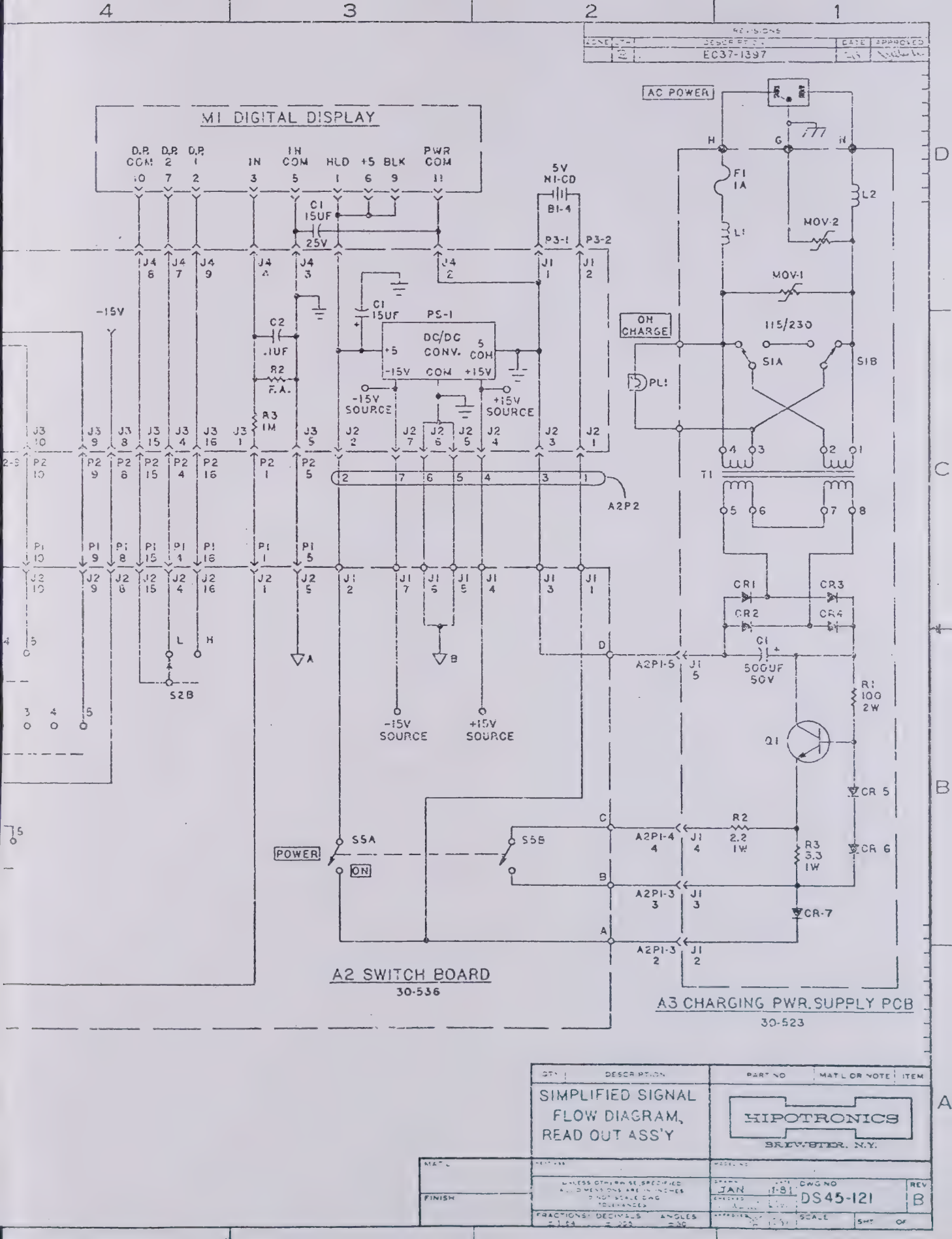
HIPOTRONICS
BREWSTER, N.Y.

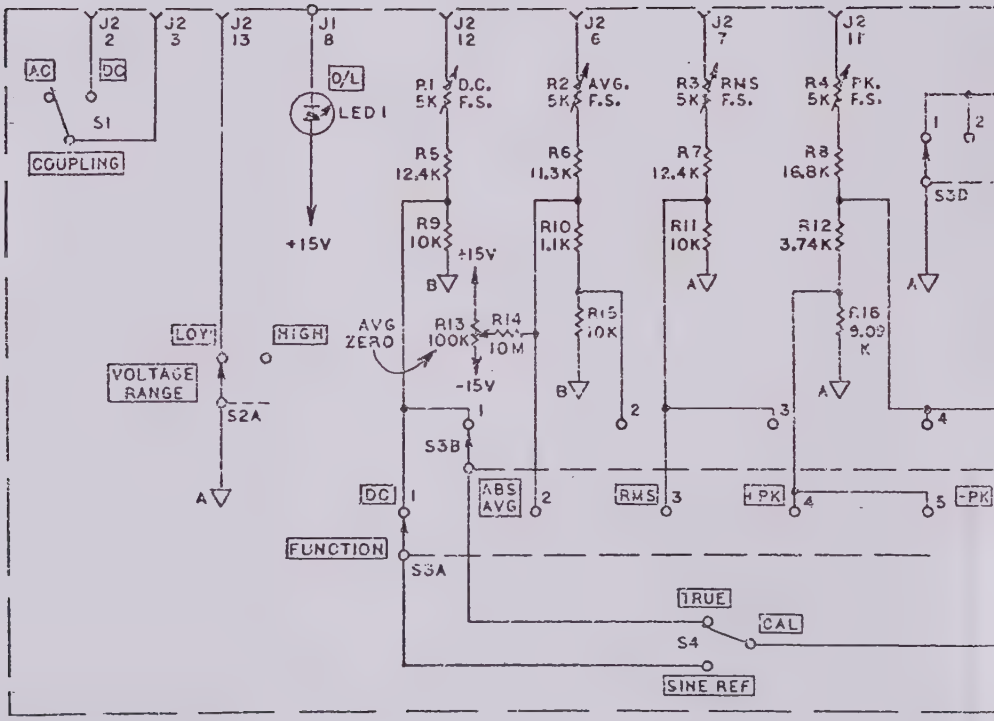
NEXT ASSY		MODEL NO	

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DWG TOLERANCES			DRAWN KEN	DATE 7/79	DWG NO. AS45-114	REV
			CHECKED	9-79		
FRACTIONS ±1/64	DECIMALS ±.005	ANGLES ±30'	APPROVED		SCALE	SHT OF

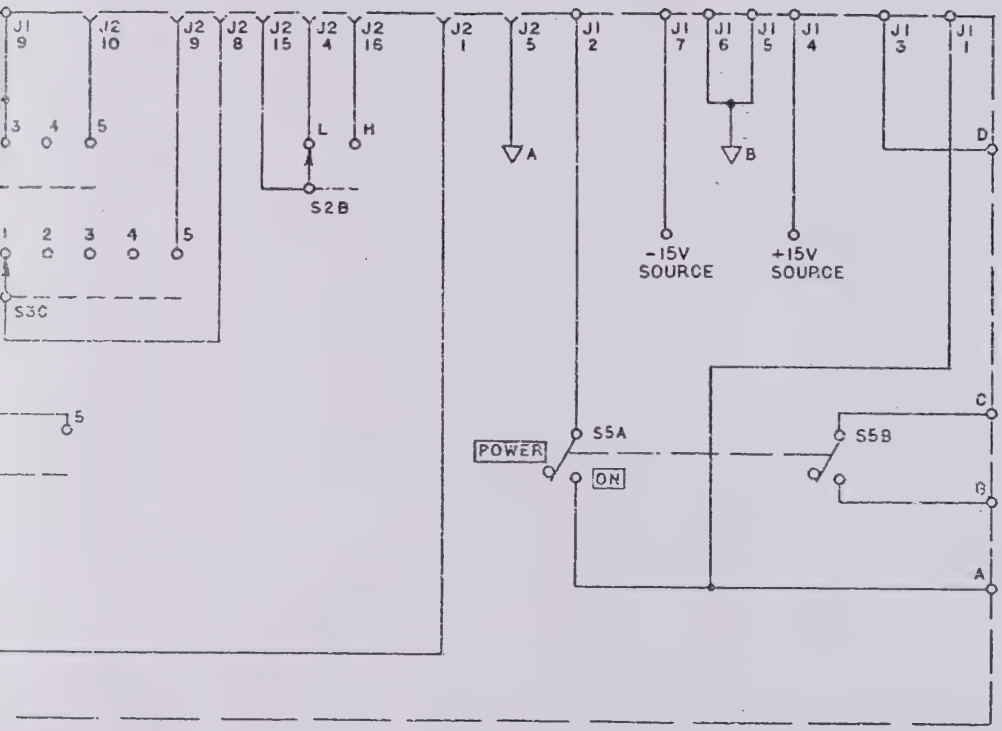


1. ALL RESISTOR VALUES IN OHMS UNLESS SPEC. OTHERWISE


4
3
2
1
REVISIONS
ZONE
DESCRIPTION
EC37-1397
DATE
APPROVED
M1 DIGITAL DISPLAY
D.P. COM 10
D.P. 2 7
D.P. 1 2
IN 3
IN COM 5
HLD 1
+5 6
BLK 9
PWR COM 11
5V NI-CD B1-4
C1 15UF 25V
P3-1
P3-2
J4 6
J4 7
J4 9
J4 4
J4 3
J4 2
J1 1
J1 2
-15V
C2 .1UF
R2 F.A.
R3 1M
C1 15UF
PS-1
DC/DC CONV.
+5
COM
-15V
COM
+15V
-15V SOURCE
+15V SOURCE
AC POWER
H
G
N
F1 1A
L1
L2
MOV-2
MOV-1
ON CHARGE
115/230
S1A
S1B
PL1
T1
A2P2
CR1
CR2
CR3
CR4
C1 500UF 50V
A2P1-5
J1 5
D
R1 100 2W
Q1
CR 5
CR 6
CR-7
R2 2.2 1W
R3 3.3 1W
A2P1-4 4
J1 4
A2P1-3 3
J1 3
A2P1-3 2
J1 2
C
B
A
S2B
L
H
A
B
S5A
S5B
POWER
ON
A2 SWITCH BOARD
30-536
A3 CHARGING PWR. SUPPLY PCB
30-523
SIMPLIFIED SIGNAL FLOW DIAGRAM, READ OUT ASS'Y
HIPOTRONICS
BREWSTER, N.Y.
DRAWN JAN 1-81
DWG NO DS45-121
REV B
SCALE
SHT OF


J2 2
J2 3
J2 13
J1 8
J2 12
J2 6
J2 7
J2 11
AC
DC
S1
COUPLING
O/L
LED 1
+15V
R1 5K
D.C. F.S.
R2 5K
AVG. F.S.
R3 5K
RMS F.S.
R4 5K
PK. F.S.
R5 12.4K
R6 11.3K
R7 12.4K
R8 16.8K
R9 10K
R10 1.1K
R11 10K
R12 3.74K
S3D
B
A
LOW
HIGH
VOLTAGE RANGE
S2A
AVG ZERO
R13 100K
R14 10M
-15V
R15 10K
R16 9.09 K
S3B
DC
ABS AVG
RMS
+PK
-PK
FUNCTION
S3A
TRUE
CAL
S4
SINE REF

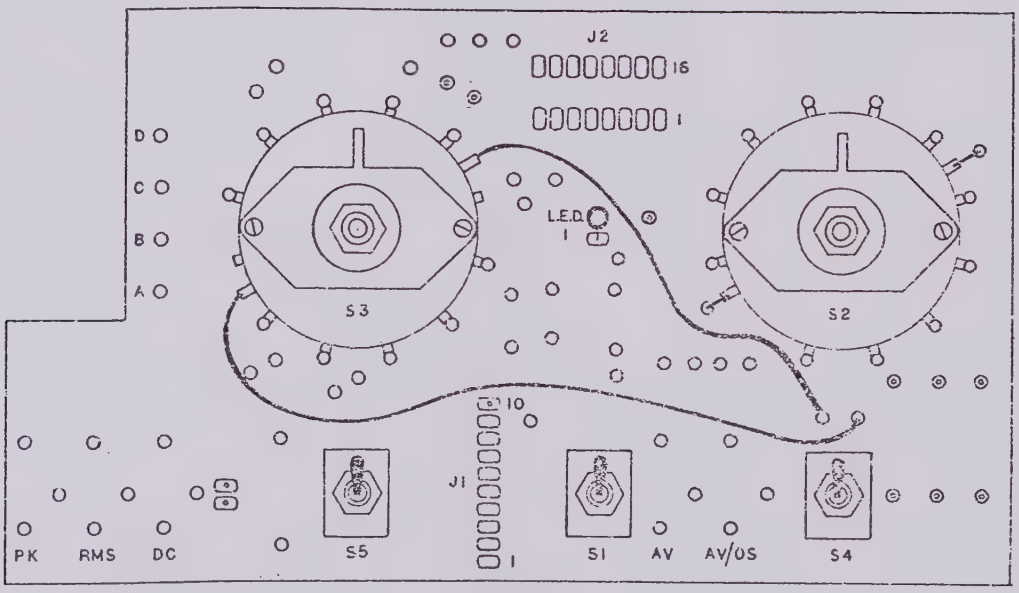
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	EC 37-1462	7-31	



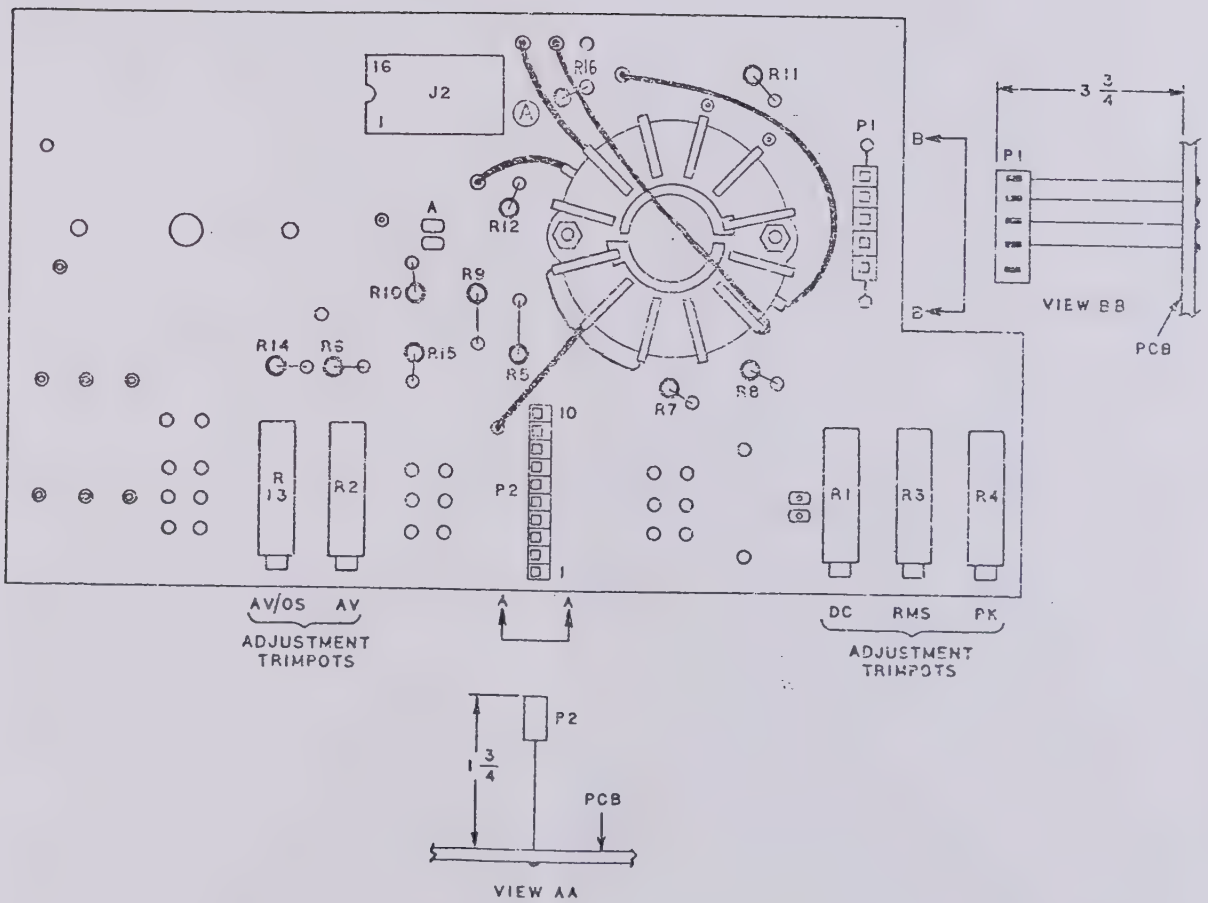
QTY	DESCRIPTION	PART NO	MATL OR NOTE	ITEM
	SWITCH BOARD 30-536			

HIPOTRONICS
BREWSTER, N.Y.

MATL			
FINISH	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DWG TOLERANCES	DRAWN JAN 1-31	DWG NO. DS60-536 REV A
	FRACTIONS DECIMALS ANGLES	APPROVED	SCALE SHT 1 OF 2


J2
16
1
D
C
B
A
L.E.D.
S3
S2
10
J1
1
PK
RMS
DC
S5
S1
AV
AV/OS
S4

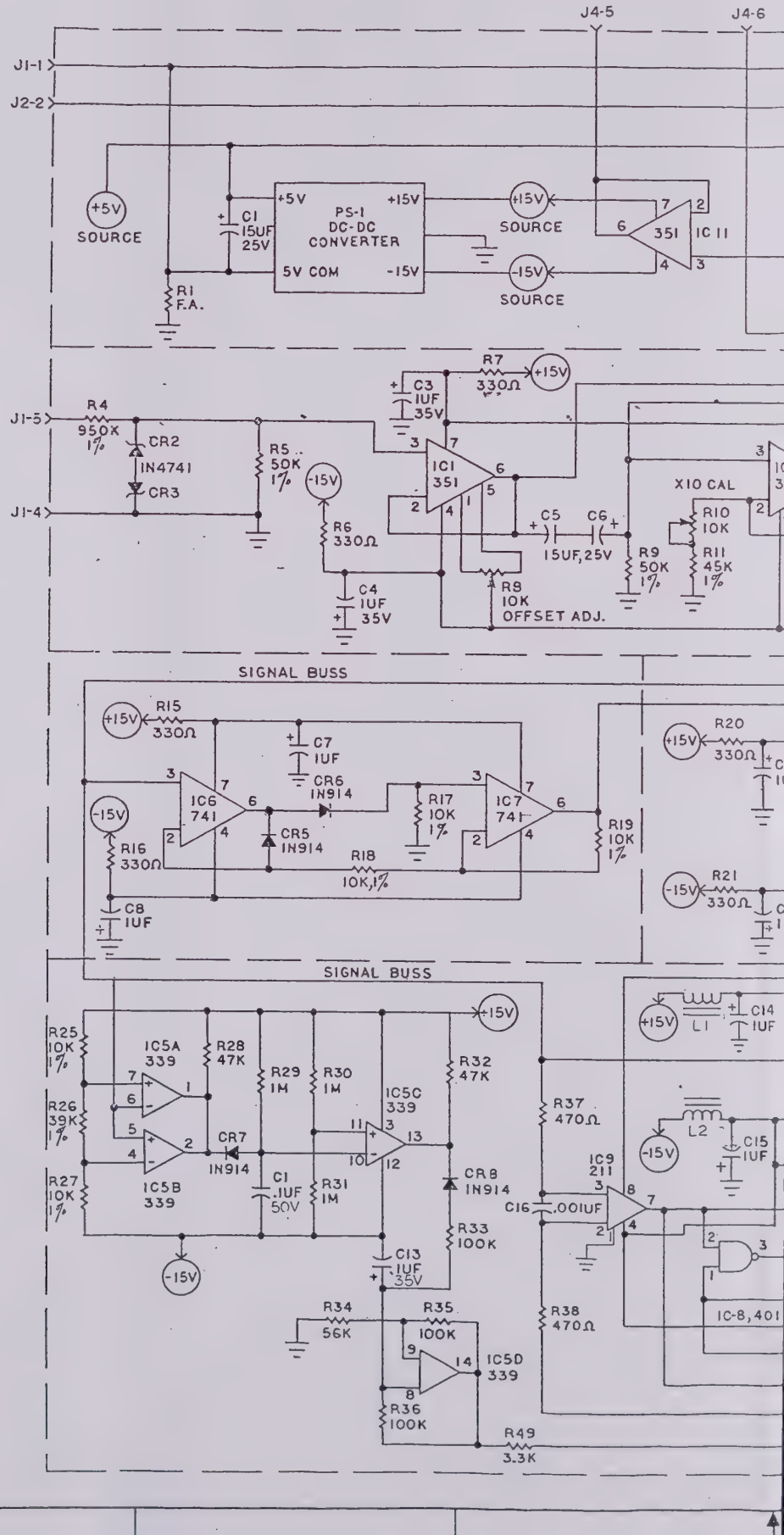
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	EC37-480	7-8-[illegible]	



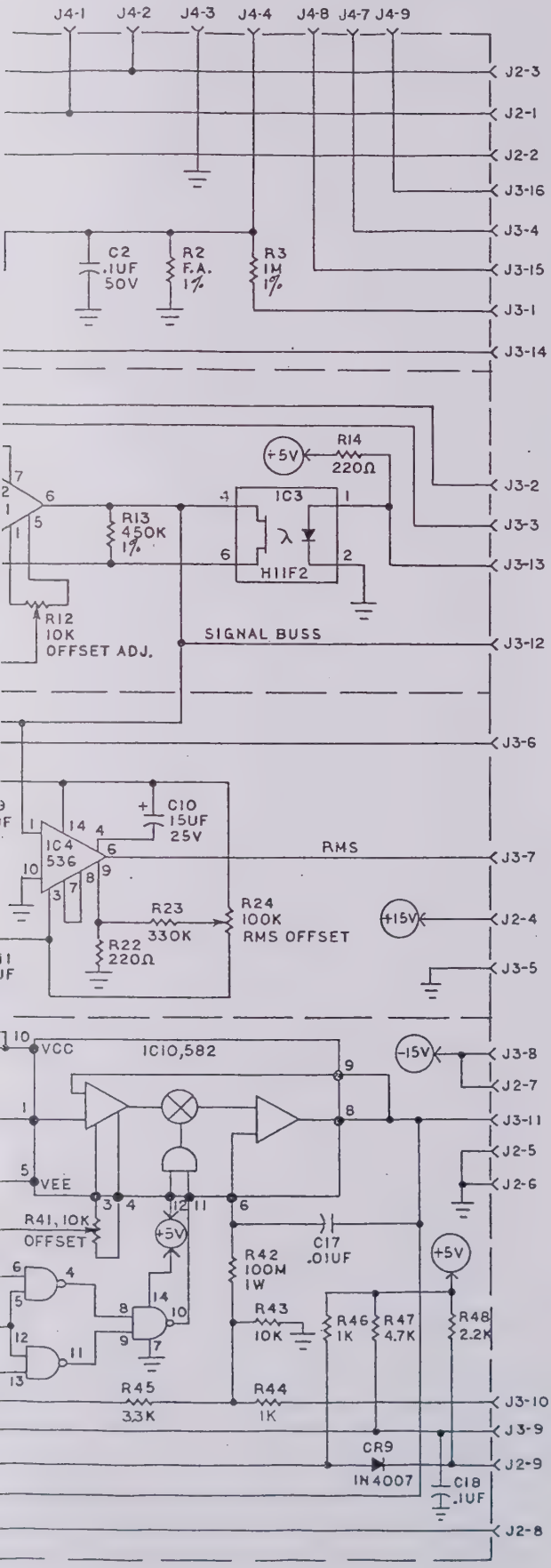
QTY	DESCRIPTION	PART NO	MAT'L OR NOTE	ITEM
	SWITCHBOARD 30-536			

HIPOTRONICS
BREWSTER, N.Y.

MAT'L			
FINISH	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DWG TOLERANCES FRACTIONS DECIMALS ANGLES	DRAWN JSK 2-81	D060-536 REV A
		SCALE	SHT 2 OF 2


J4-5
J4-6
J1-1
J2-2
+5V SOURCE
C1 15UF 25V
+5V
PS-1 DC-DC CONVERTER
+15V
5V COM
-15V
+15V SOURCE
-15V SOURCE
351
IC 11
R1 F.A.
J1-5
J1-4
R4 950K 1%
CR2 IN4741
CR3
R5 50K 1%
-15V
R6 330Ω
C4 1UF 35V
R7 330Ω
+15V
C3 1UF 35V
IC1 351
C5
C6
15UF, 25V
X10 CAL
R10 10K
R11 45K 1%
R9 50K 1%
R8 10K OFFSET ADJ.
SIGNAL BUSS
+15V
R15 330Ω
C7 1UF
CR6 IN914
IC6 741
-15V
R16 330Ω
CR5 IN914
R18 10K,1%
R17 10K 1%
IC7 741
R19 10K 1%
C8 1UF
+15V
R20 330Ω
-15V
R21 330Ω
SIGNAL BUSS
+15V
L1
C14 1UF
R25 10K 1%
IC5A 339
R28 47K
R29 1M
R30 1M
IC5C 339
R32 47K
R26 39K 1%
R27 10K 1%
IC5B 339
CR7 IN914
C1 .1UF 50V
R31 1M
CR8 IN914
R33 100K
C13 1UF 35V
-15V
R34 56K
R35 100K
IC5D 339
R36 100K
R49 3.3K
R37 470Ω
L2
C15 1UF
IC9 211
C16 .001UF
R38 470Ω
IC-8,401

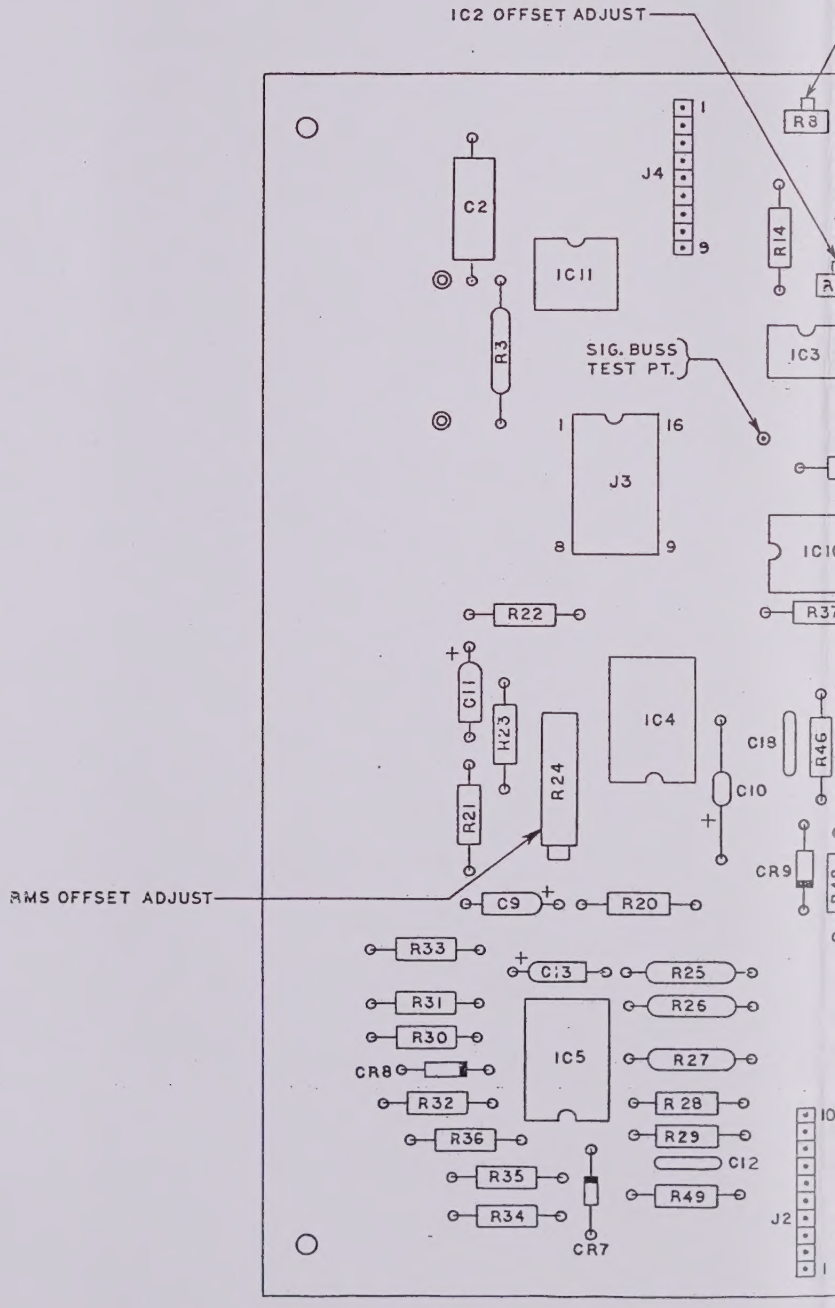
REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	B	EC37-2649 KR	10-86	



QTY	DESCRIPTION	PART NO.	MAT'L OR NOTE	ITEM
	MAIN CIRCUIT 30-539			

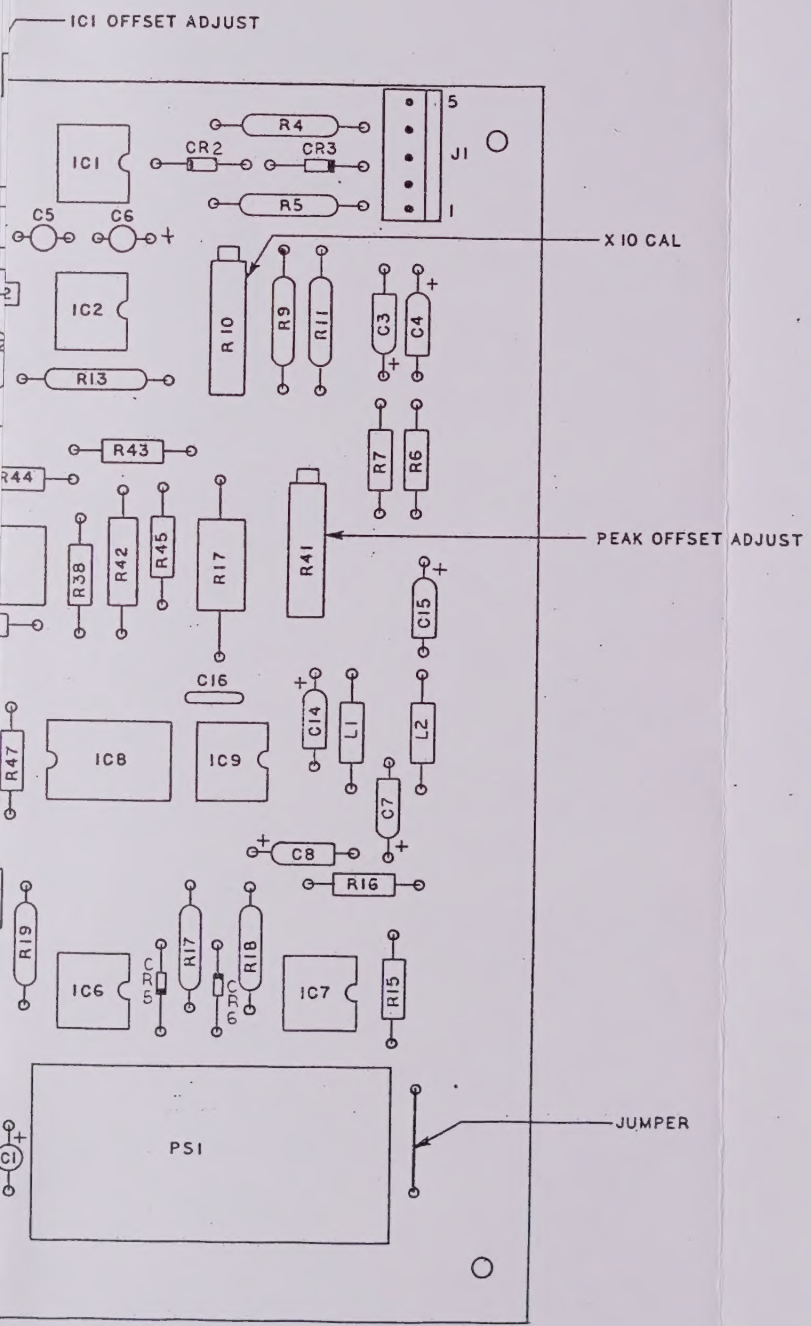
HIPOTRONICS
BREWSTER, N.Y.

MAT'L	NEXT ASSY	MODEL NO	
FINISH	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DWG TOLERANCES	DRAWN JAN 1-81	DWG NO. DS60-539
	FRACTIONS ± 1/64 DECIMALS ± .005 ANGLES ± 30'	CHECKED 1/1 APPROVED	SCALE SHT 1 OF 2


IC2 OFFSET ADJUST
R8
J4
1
9
C2
R14
IC11
R3
SIG. BUSS
TEST PT.
IC3
1
16
J3
8
9
R22
C11
R23
IC4
C18
R46
R24
C10
R21
CR9
RMS OFFSET ADJUST
C9
R20
R33
C13
R25
R31
R26
R30
IC5
R27
CR8
R28
R32
R29
R36
C12
R35
R49
R34
CR7
J2
10
1

4 3 2 1

REVISIONS			
ZONE	LTR	DESCRIPTION	DATE / APPROV



QTY	DESCRIPTION	PART NO.	MAT'L OR NOTE	ITE
	MAIN CIRCUIT 30-539			

HIPOTRONICS
BREWSTER, N.Y.

MAT'L	"TEST ASSY"	MODEL NO		
FINISH	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DWG TOLERANCES	DRAWN JAN	DATE 2-81	DWG NO. DS60-539
		CHECKED		
	FRACTIONS ±1/64 / DECIMALS ±.002 / ANGLES ±30'	APPROVED		SCALE SHT 2 OF 2

MP MASTER
MA35117